

REMARKS

Claims 1-20 were examined and reported in the final Office Action. Claims 11-14 stand rejected under 35 U.S.C. § 112, 1st paragraph. Claims 1, 3, 11, 13, 15-17, 19 and 20 are rejected as anticipated by *Maenz* (GB 2,340,727). Claims 11, 13 and 14 are rejected as anticipated by *Barendse* (U.S. Pat. No. 5,827,709). Claims 11-14 are rejected as obvious over *Barendse* in view of *Cobb* (U.S. 6,623,750). Claims 1-7, 9, 10, 11, 13, 15-17, 19 and 20 are rejected as obvious over *Maenz* with *Vanderbeke* (U.S. Pat. No. 5,443,979), *Winthrop* (U.S. Pat. No. 3,812,013) and/or *Mantha* (EP 57146). Claims 1-11 and 13-20 are rejected as obvious over *Maenz*, *Vanderbeke*, *Winthrop* and *Mantha* in view of *Tobey, Jr.* (U.S. Pat. No. 5,662,901). Claims 1-7, 9-11, 13, 15-17, 19 and 20 are rejected as obvious over *Maenz*, *Vanderbeke*, *Winthrop* and *Mantha* with *Nielsen* (U.S. Pat. No. 5,989,600). Claims 1-20 are rejected as obvious over *Maenz* in view of *Cobb* and *Vanderbeke*.

Claims 1-4 and 15-20 are cancelled above. Claims 5 and 13 are amended and new claims 21 and 22 are added. Claims 5-14, 21 and 22 are now pending. In view of the above amendments, reconsideration and withdrawal of the rejections are respectfully requested.

A. 35 U.S.C. § 112, 1st Paragraph Rejection of Claims 11-14 Addressed.

Claim 11 stands rejected for lack of description supporting application of exogenous phytase and cellulase in a dry state, based on an observation that pages 11 and 12 of the specification teach enzymes diluted in water or in liquid form. However, at page 10 [45], a formulation of dried *Trichoderma viride* fermentation extract containing cellulase enzyme suitable for application with an exogenous phytase enzyme is described. This dry formulation is in contrast to the water and propylene glycol formulation described at page 10 [44].

Claim 13 has been amended to include the term “exogenous” before each listed enzyme. Although the previous form in which the leading “exogenous” term was applicable to each of the listed enzymes, the amendment clarifies this point.

Claim 5 has been amended with the order of phrases changed only, to clarify the claimed invention. No new matter is added.

Withdrawal of the § 112 rejection of claims 11-14 is respectfully requested.

B. Rejection of Claims 1, 3, 11, 13, 15-17, 19 and 20 over *Maenz* is Addressed.

Claims 1-4 and 15-20 having been cancelled, reconsideration and withdrawal of the rejection relative to claims 11 and 13 are requested.

Maenz teaches a process for converting phytate in a food into inorganic phosphate comprising the steps of

- (1) mechanically mixing a slurry containing
 - (a) a phytate containing food,
 - (b) a solvent mixture comprising
 - (i) water
 - (ii) a water-immiscible organic solvent
 - (c) a phytase
- (2) drying the food.

See, *Maenz*, page 4, line 24 – page 5, line 7. The technique creates a slurry of the phytate-containing food in which the phytase catalyze the breakdown of the phytate in the food to inorganic phosphate prior to drying and feeding the food to monogastric animals. So, while the dried end product of *Maenz* may contain dry phytase, the feed is not treated with a “dry phytase”, the feed is treated with a slurry containing a phytase and the already treated feed is then allowed to dry. It is only after treatment of the food in the slurry, that the phytase and the feed are dried. After the phytase is dried, it is not then applied to the feed.

In contrast, the method of claim 11 claims the treatment of feed with a dry enzyme formulation consisting essentially of a dry exogenous phytase enzyme and a dry exogenous cellulase, and the feeding the dry formulation to ruminants. The method is not directed towards breakdown of the phytate-containing food as a predigestion step, as is taught by *Maenz*, but rather as a method of applying dry phytase and cellulase enzymes to feed, so that in the phytase can then be used by the ruminants after eating the feed to digest the phytate therein, leading to increased phosphate uptake and decrease ruminant phosphate excretion.

Claims 11 and 13 being patentably distinguishable over *Maenz*, withdrawal of the rejection of claims 11 and 13 under 35 U.S.C. § 102(b) is thus proper and respectfully requested.

C. § 102 Rejection of Claims 11, 13 and 14 over *Barendse* is Addressed

The dry enzyme formulation of the present invention consists essentially of a dry exogenous phytase enzyme adapted to be applied to the ruminant feed in a

dry state together with a dry exogenous cellulase enzyme adapted to be applied to the ruminant feed in a dry state. This formulation, due in part to its transition language, is not anticipated by *Barendse*.

Barendse teaches the dissolution of enzymes in an inorganic salt solution, then drying the solution to obtain a product in which it claims the activity of the enzymes are enhanced. *Barendse* data suggests that the association of the enzymes with the inorganic salt in the dried composition materially changes activity levels, indicating that the additional ingredients do indeed have a material effect on the enzyme ingredients. *Barendse* at col. 5, lines 13-18. Clearly, the presence of the dried inorganic salt in the *Barendse* formulations, regardless of how the salt is bound to or associated with the enzymes, prevents the compositions of *Barendse* from anticipating the claimed enzyme composition with its “consisting essentially of” transition language.

Indeed, for purposes of any obviousness rejection, it must be said that *Barendse* teaches away from the claimed invention consisting essentially of dried phytase and dried cellulase adapted for applying to dried feed, by discouraging the application of dried enzymes without previous solubilization in an inorganic salt solution. Accordingly, claim 11 and dependent claims 13 and 14 are both novel and non-obvious over *Barendse*.

D. § 103 Rejection of Claims 11-14 over *Barendse* with *Cobb* is Addressed

The distinguishing features of claim 11 over *Barendse* discussed above apply equally to the obviousness rejection of claims 11-14 over the combination of *Barendse* in view of *Cobb*.

While it is proper to rely upon *Cobb* for teaching the different fermentation extracts recited in claims 12, 13 and 14, *Barendse*’ teaching away from a dried enzyme composition which “consists essentially of “ dried phytase and dried cellulase without other active or enhancing ingredients, means there is no motivation to utilize the fermentation extracts of *Cobb* without first solubilizing the enzymes in an inorganic salt solution and then drying the solution to obtain dried enzymes somehow bonded or associated with the additional salt constituents.

Since claims 11-14 all recite a dried enzyme formulation in which enhancing salts cannot be present in view of the “consisting essentially of” preamble, there is no motivation to change the salt formulations of *Barendse*,

even if the extracts are taught by *Cobb*, to obtain the claimed compositions. Thus, claims 11-14 are non-obvious over the combination of *Barendse* and *Cobb*.

E. § 103 Rejection of Claims 1-7, 9, 10, 11, 13, 15-17, 19 and 20 over *Maenz* with *Vanderbeke*, *Winthrop*, and *Mantha* is Addressed

The cancellation above of claims 1-4 and 15-20 renders moot the rejection of claims 1-4, 15-17, 19 and 20, so that the rejection is now only applicable to claims 5-7, 9-11 and 13.

As discussed above, *Maenz* teaches a slurry—a wet formulation, in which dried food is treated with enzymes. Pre-digestion takes place in this wet enzyme slurry, so that the food product subsequently fed to the animals contains inorganic phosphate which is digestible by monogastric animals, to which *Maenz* is directed. One skilled in the art would surely know that if one were to modify *Maenz* to apply dry enzymes to the feed and then feed to dry enzyme/feed mixture to animals, predigestion of the phytates to inorganic phosphate would not occur. Thus, to the extent that any of *Vanderbeke*, *Winthrop*, or *Mantha* actually teach a dried enzyme extract, there is no motivation to modify *Maenz* to use a dried enzyme extract to accomplish a phytate to inorganic phosphate conversion prior to animal ingestion, as such breakdown would not be expected to occur in the absence of liquid/slurry formulation which is fundamental to *Maenz*.

In the absence of such motivation to combine references, *prima facie* obvious is not established by a § 103 rejection of claims 5-7, 9-11 and 13 based on a combination of *Maenz* taken with *Vanderbeke*, *Winthrop*, or *Mantha* or any combinations thereof. Accordingly, claims 5-7, 9-11 and 13 are non-obvious over the *Maenz* taken with *Vanderbeke*, *Winthrop* and *Mantha*, so that withdrawal of the rejection is proper and respectfully requested.

F. § 103 Rejection of Claims 1-11 and 13-20 over *Maenz* with *Vanderbeke*, *Winthrop*, *Mantha* and *Tobey, Jr* is Addressed

Claims 1-11 and 13-20 are rejected as obvious over *Maenz*, *Vanderbeke*, *Winthrop* and *Mantha* in view of *Tobey, Jr.*. The rejection is respectfully traversed relative to pending claims 4-11, 13 and 14.

While *Tobey* does teach enzyme formulations containing the recited enzymes, there is no motivation to combine *Tobey* with *Maenz* in view of the

fundamental teaching of *Maenz*—a slurry applied to animal feed to predigest phytates in the feed to inorganic phosphates, prior to consumption of the feed.

In the absence of such motivation to combine references, *prima facie* obvious is not established by a § 103 rejection of claims 4-11, 13 and 14 based on a combination of *Maenz* taken with *Vanderbeke*, *Winthrop*, *Mantha* and *Tobey, Jr.* or any combinations thereof. Accordingly, claims 4-11, 13 and 14 are non-obvious over such a combination, making withdrawal of the rejection proper and respectfully requested.

G. § 103 Rejection of Claims 1-7, 9, 10, 11, 13, 15-17, 19 and 20 over *Maenz* with *Vanderbeke*, *Winthrop*, and *Mantha* with *Nielsen* is Addressed

The cancellation above of claims 1-4 and 15-20 renders moot the rejection of claims 1-4, 15-17, 19 and 20, so that the rejection is now only applicable to claims 4-7, 9-11 and 13.

As discussed above, *Maenz* teaches a slurry—a wet formulation, in which dried food is treated with enzymes. Predigestion takes place in this wet enzyme slurry, so that the food product subsequently fed to the animals contains inorganic phosphate which is digestible by monogastric animals, to which *Maenz* is directed. One skilled in the art would surely know that if one were to modify *Maenz* to apply dry enzymes to the feed and then feed to dry enzyme/feed mixture to animals, predigestion of the phytates to inorganic phosphate would not occur. Thus, to the extent that any of *Vanderbeke*, *Winthrop*, or *Mantha* actually teach a dried enzyme extract, there is no motivation to modify *Maenz* to use a dried enzyme extract to accomplish a phytate to inorganic phosphate conversion prior to animal ingestion, as such breakdown would not be expected to occur in the absence of liquid/slurry formulation which is fundamental to *Maenz*.

Nielsen is relied upon for teaching sequential steps. However, in the absence of motivation to combine the listed references with *Maenz*, one does not arrive at the claims at issue, which recite dry phytase and dry cellulase added to dry feed. Thus, *prima facie* obvious is not established by a § 103 rejection of claims 4-7, 9-11 and 13 based on a combination of *Maenz* taken with *Vanderbeke*, *Winthrop*, *Mantha* and *Nielsen*. Accordingly, claims 4-7, 9-11 and 13 are non-obvious over the combination and withdrawal of the rejection is proper and respectfully requested.

H. § 103 Rejection of Claims 1-20 over *Maenz* with *Vanderbeke* and *Cobb* is Addressed

After cancellation of claims 1-4 and 15-20, claim 5-14 stand rejected as obvious over *Maenz*, *Vanderbeke*, and *Cobb*. The rejection is respectfully traversed.

As discussed above, the fundamental teaching of *Maenz*—the use of a slurry applied to animal feed to predigest phytates in the feed to inorganic phosphates, prior to consumption of the feed—would not be achieved if one were to apply the dry phytases of *Vanderbeke* with enzymes from the extracts of *Cobb*. Accordingly, there is no motivation to modify *Maenz* with the teachings of *Vanderbeke* and *Cobb* to obtain the claimed invention consisting essentially of dry phytase and dry cellulase applied to dry feed and then fed to ruminants.

In the absence of such motivation to combine references, *prima facie* obvious is not established by a § 103 rejection of claims 5-14 based on a combination of *Maenz* taken with *Vanderbeke*, and *Cobb*. Accordingly, claims 5-14 are non-obvious over such a combination, making withdrawal of the rejection proper and respectfully requested.

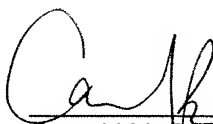
I. Conclusion and Petition for Two-Month Extension

Pending claims 4-14, 21 and 22 being patentably distinguishable over the references of record, allowance of claims 4-14, 21 and 22 is requested. Should any outstanding issues remain, the Examiner is asked to telephone the undersigned.

Applicant hereby petitions for a Two-Month Extension to September 21, 2006. Please charge Deposit Account No. 50-1123 the large entity extension fee, the multiple dependent claim fee and any other required fees.

Respectfully submitted,

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